3. ALTERNATIVES

This chapter describes the alternatives' screening process, the alternatives dismissed from full evaluation, and the alternatives carried forward for full analysis in this EIR/EIS.

3.1 FACTORS USED IN SELECTION OF ALTERNATIVES

3.1.1 Alternatives Development and Screening Process

One of the most important aspects of the environmental review process is the identification and assessment of reasonable alternatives that have the potential for avoiding or minimizing the impacts of a proposed project. In addition to mandating consideration of the No Project Alternative, both the State CEQA Guidelines [14 CCR §15126.6(d)] and the NEPA Regulations (40 CFR §1502.14) emphasize the selection of a range of reasonable alternatives, including a no project/action alternative, and the adequate assessment of these alternatives to allow for a comparative analysis for consideration by decision-makers.

The State CEQA Guidelines require consideration of a range of reasonable alternatives to the Project or project location that: (1) could feasibly attain most of the basic project objectives; and (2) would avoid or substantially lessen any of the significant impacts of the proposed Project. An alternative cannot be eliminated simply because it is more costly or if it could impede the attainment of all project objectives to some degree. However, the State CEQA Guidelines declare that an EIR need not consider an alternative whose effects cannot be reasonably ascertained and whose implementation is remote or speculative. The CEQA requires that an EIR include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the proposed Project. For documents completed under a joint EIR/EIS, the NEPA Regulations (40 CFR §1502.14 [c]) also identify the need to consider reasonable alternatives including those not within the jurisdiction of the lead agency.

This screening analysis does not focus on relative economic factors of the alternatives (as long as they are feasible) since the State CEQA Guidelines require consideration of alternatives capable of eliminating or reducing significant environmental effects even though they may "impede to some degree the attainment of project objectives or would be more costly." In addition, the NEPA (40 CFR §1502.23) requires that the merits and drawbacks of the various alternatives need not be displayed in a monetary cost benefit analysis and that economic concerns should not outweigh important qualitative considerations. In any event, the EIS should at least indicate those considerations including factors not related to environmental quality that may be relevant and important to decision-makers. Likewise, the question of market demand is not considered.

3.1.2 Alternatives Screening Methodology

Alternatives to the proposed Project were selected based on the input provided from the Applicant, the EIR/EIS study team, and the public and local jurisdictions during the EIR/EIS scoping process. The alternatives screening process consisted of three steps:

Step 1: Define the alternatives to allow comparative evaluation.

Step 2: Evaluate each alternative in consideration of the following criteria:

- the extent to which the alternative would accomplish most of the basic goals and objectives of the Project;
- the extent to which the alternative would avoid or lessen one or more of the identified significant environmental effects of the Project;
- the potential feasibility of the alternative, taking into account site suitability, economic viability, availability of infrastructure, General Plan consistency, and consistency with other applicable plans and regulatory limitations; and
- the requirement of both the State CEQA Guidelines and the NEPA Regulations to consider a "no project/action" alternative and of the State CEQA Guidelines to identify under specific criteria, an "environmentally superior" alternative in addition to the "no project/action" alternative (State CEQA Guidelines, 14 CCR §15126.6(e) and NEPA Regulations, 40 CFR §1502.14 (d)).

Step 3: Determine suitability based on the above criteria, of the proposed alternative for full analysis in the EIR/EIS. If the alternative is unsuitable, eliminate it, with appropriate justification, from further consideration.

Feasible alternatives that did not clearly offer the potential to reduce significant environmental impacts and alternatives that do not conform to the CEQA/NEPA requirements for feasibility were removed from further analysis. In the final phase of the screening analysis, the environmental advantages and disadvantages of the remaining alternatives were carefully weighed with respect to potential for overall environmental advantage, technical feasibility, and consistency with project and public objectives.

If an alternative clearly does not provide any environmental advantages as compared to the proposed Project, it is eliminated from further consideration. At the screening stage, it is not possible to evaluate potential impacts of the alternatives or the proposed Project with absolute certainty. However, it is possible to identify elements of the proposed Project that are likely to be the sources of impact. The assessment of potential

significant effects of the proposed Project in Section 4 resulted in identification of the following potentially significant impacts:

- Air pollutant emissions from cable laying operations and horizontal directional drilling;
- Disturbance or damage to undersea cultural resources, including shipwrecks, along the cable route;
- Water resources that could be affected by accidental releases of petroleum or other hazardous substances during main lay cable operations and horizontal directional drilling operations;
- Potential increased cumulative risk of marine vessel conflicts during cable installation; and
- Noise generated by cable laying operations, horizontal directional drilling, and cable removal.

These potential impacts were used as the basis for selection and evaluation of alternatives.

For the screening analysis, the technical and regulatory feasibility of various potential alternatives was assessed at a general level. Specific feasibility analyses are not needed for this purpose. The assessment of feasibility was directed toward reverse reason, that is, an attempt was made to identify anything about the alternative that would be infeasible on technical or regulatory grounds. For the proposed Project, those issues relate to:

- Locating the cable in an area that would not support the purpose and need of the proposed project;
- Exposing the cable to excessive risk of damage (by locating the cable in areas of instability prone to subsidence or mass wasting events);
- Avoiding rocky outcrops and areas with hard substrate morphologies; and
- Availability of space in roads, conduits, or utility corridors for the cable, and the likelihood of obtaining a right-of-way easement from these owners.

3.1.3 Summary of Screening Results

Several alternatives were eliminated based on the infeasibility of placing the cable in areas that would not provide the deep water test bed required to meet project objectives

or supply the required power and data transfer necessary to support long-term underwater research. Other alternatives were eliminated because the cable would be placed in high-risk environments, including crossing Monterey Canyon. These areas are subject to periodic landslides and mass wasting events that would likely affect the survivability of the cable. Those alternatives that were found to be technically feasible and largely consistent with the Applicant's objectives were reviewed to determine if the alternative had the potential to avoid, reduce, or mitigate the environmental impacts of the proposed Project.

Table 3.1-1 represents the evaluation and selection of potential alternatives to be addressed in the EIR/EIS. Those listed in the first column have been eliminated from further consideration (see rationale in Section 3.2), and those in the second column are evaluated in detail in Section 4 of this EIR/EIS.

Table 3.1-1. Summary of Alternative Screening Results

Alternatives Eliminated from Full Evaluation	Alternatives Evaluated in this EIR/EIS
Alternative 3 (Southern Cable Route)	Alternative 1 (Duke Pipeline to MBARI Property)
Alternative 4 (Duke Energy Landing)	Alternative 2 (Moss Landing Marine Lab Pier)
Alternative 5 (Data Buoys)	No Project/Action Alternative

3.2 ALTERNATIVES ELIMINATED FROM FULL EVALUATION

Several potential alternatives were assessed for their potential to reasonably achieve the project objectives and reduce potential significant environmental impacts of the proposed Project. Also, their technical and regulatory feasibility was evaluated. Based on these screening criteria, the alternatives listed in the first column of Table 3.1-1 above were eliminated from detailed EIR/EIS consideration. The following discussions describe these potential alternatives and the basis for their elimination.

3.2.1 Alternative 3: Southern Cable Route

Description

As illustrated in Figure 3.2-1, Alternative 3 would extend from the shore into Monterey Bay along the south side of the Monterey Bay Canyon. The cable would head in a general southwesterly direction for approximately 31 miles (50 km) and terminate at the

Placeholder for Figure 3.2-1 Southern Cable Route

science node at a depth of 426.5 feet (130 m). This alternative was developed by the Applicant during the initial research and assessment of potential routes.

Rationale for Elimination

This route cannot reach a location on the western side of the San Gregorio Fault line without crossing the Monterey Canyon. This would expose the cable to substantial risks from geologic activity, including landslides and mass wasting events. Experience has shown that equipment or cables placed in the Canyon at this location would likely survive less than a year before being destroyed by mass wasting events. Mass wasting is defined as the down slope movement of material under the direct influence of gravity and can result in the lateral movement of massive amounts of sediment. One of the scientific aims of the Project, identified in its Purpose and Need, is to connect the cable to a permanent broadband seismometer located west of the San Gregorio fault line to complement the land-based network of broadband seismic stations. This would: (1) provide better directional coverage and thereby improve the characterization of moderate to large earthquakes occurring in northern California along the San Andreas system, and (2) improve knowledge of the deep structure of this plate boundary. Also, the cable would provide long-term deployment of broadband systems for the successful development of long-term global seismic sea floor observatories in this area.

Further, Alternative 3 would not provide access to active seeps or chemosynthetic biological communities. These are important study sites that, if connected to a cabled observatory, would enable important long-term data to be collected on these benthic communities. Likewise, the Project is a test bed for a deep water cabled observatory, and many of the components and systems to be tested require a deep water site. If the node is placed in a position where it does not cross the submarine canyon, the depth of the Alternative 3 node would be only 426.5 feet (130 m), and the engineering systems need water depths closer to 3,281 feet (1,000 m). In addition, the cable route contains many large rock outcrops on the edge of the continental shelf that would minimize the amount of cable that could be buried.

As Alternative 3 would not meet the purpose and need of the Project and would not result in a reduction of potential environmental impacts associated with the proposed Project, this alternative was eliminated from further analysis.

3.2.2 Alternative 4: Duke Energy Landing

Description

The Duke Energy Landing would be the same as the proposed Project except that the shore landing would occur through an existing fuel oil pipeline owned by Duke Energy and the Shore Facility would be on Duke Energy property rather than the proposed vacant parcel owned by MBARI . The pipeline was previously used to unload tankers and extends from shore for approximately 502 feet (153 m) in a west-northwest direction to a water depth of roughly 59 feet (18 m) (see Figure 3.2-2). The pipe is 18–24-inch (46-61-cm) carbon steel and has been well maintained by Duke Energy. The cable would run inside the pipeline from the ocean side entrance to a location approximately 0.9 miles (1.5 km) away where the pipeline surfaces from the harbor water near Highway 1. An access port would be installed in the pipeline at this location to allow the cable to be pulled ashore during cable installation. This port would also be used during cable laying operations to allow the cable to exit from the pipeline and connect to a conduit that would be installed by the Applicant. The conduit would be attached to the side of an existing fuel oil pipeline and would run approximately 492 feet (150 m) from the access port to a Shore Facility.

The Shore Facility would be located on Duke Energy property and would be similar in design to the proposed Project. A 20-foot (6-m)-long ISO van would be placed on the site containing the shore power supplies, breakers, hubs, and other equipment necess6ary to feed power and communications to the observatory cable. Power for the cable and Shore Facility would be provided by a connection to the Duke Energy power breaker panel.

Rationale for Elimination

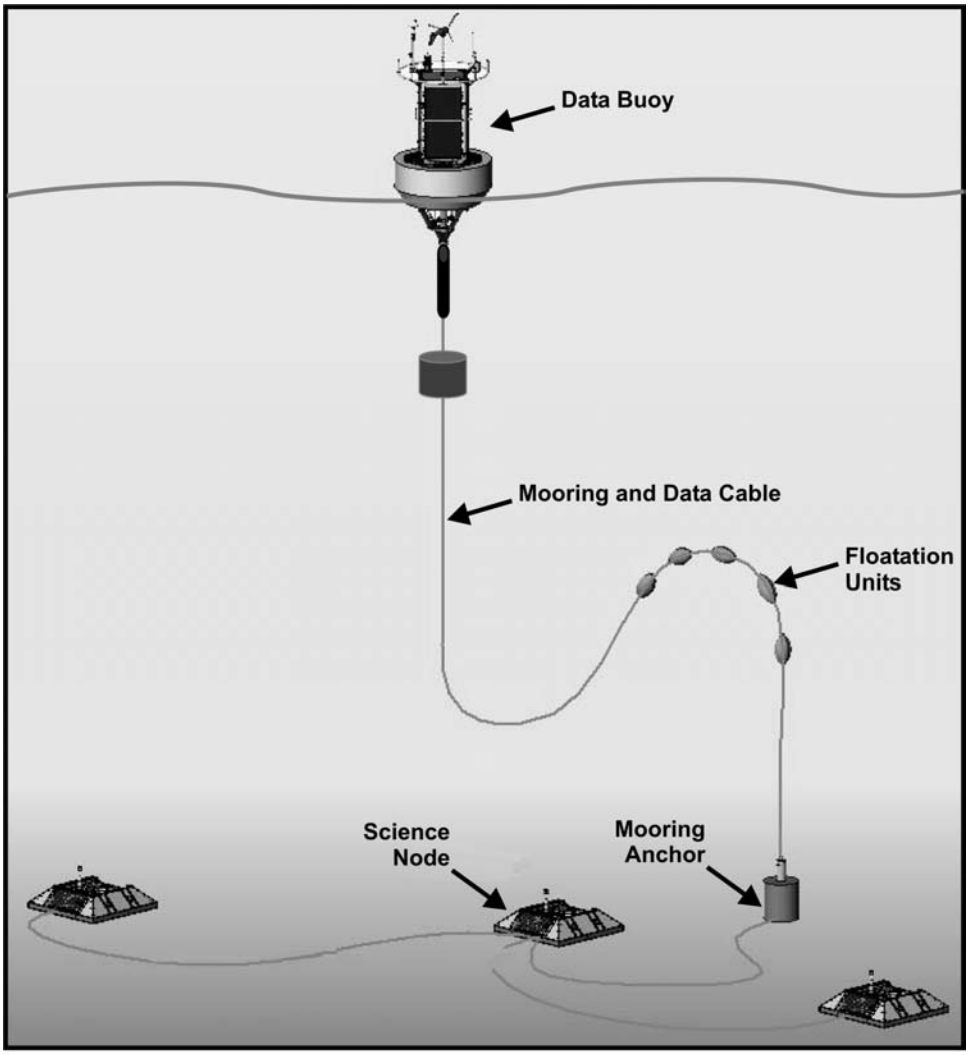
The main advantage of the Alternative 4 alignment would be to provide a shore landing for the cable through an existing conduit and eliminate the requirement for construction of a new undersea pipeline. Potential construction related impacts would be reduced compared to the proposed Project and HDD activities would not be required. This alignment would require the ISO van and support equipment to be placed close to the Duke Energy power breaker panel at the Moss Landing Power Plant. However, as a result of potential security concerns raised by the United States Coast Guard, activities in this area not directly related to the operation of the power plant are now prohibited. This Alternative is no longer feasible and was therefore eliminated from further analysis.

Placeholder for Figure 3.2-2. The Duke Energy Landing Route

3.2.3 Alternative 5: Moored Buoys

Description

Alternative 5 would utilize a series of moored buoys that would provide a wireless data link to the shore (see Figure 3.2-3). The buoys would contain scientific equipment and a compact battery power source and would be linked to the sea floor by a steel cable attached to an anchoring device. Power would also be obtained through a combination of solar cells and a wind generated turbine. Science nodes connected to fiber optic and power lines would then be arrayed up to 6 miles (10 km) from the base of the mooring line to areas of scientific interest.



Source: MBARI

Figure 3.2-3. Alternative 5 Diagram of Moored Buoy System

Rationale for Elimination

The use of moored buoys would not meet the purpose and need of the proposed Project and would not provide a test bed for a deep sea cabled observatory. The MARS system is designed to be a test-bed for future development of the NEPTUNE cabled observatory in the northwestern United States. A buoyed system would not provide the cabled system, power requirements or data transfer ability required to provide the scientific test bed to support long term undersea experiments. Although the buoys would be able to support science nodes and provide data transfer of up to 10-mbits/sec, this would result in an order of magnitude reduction in data transfer capability compared to the 100-mbits/sec capacity of the proposed Project. Another significant issue is the reliability of the power and data cable-mooring line interface. Current buoy line technology incorporates electrical and optical conductors along the length of the steel mooring cable. One significant concern with this alternative is that a proven design for this element of the system remains under development. The major concern with both the data and fiber optic cables is their low stretch tolerance and their susceptibility to failure. While the Applicant currently deploys several moored buoy data systems in Monterey Bay, these systems are not configured to support the wide array of equipment that could be utilized with the MARS system and cable breakage would limit the types of scientific experiments that could be conducted in Monterey Bay. Implementation of Alternative 5 would probably result in a reduction in impacts on benthic communities by the elimination of cable-burying activities. However, potential impacts on marine mammals and fishing activities could be increased from possible entanglement in the buoys mooring lines. Similarly, the moored buoys would require annual removal and maintenance which would result in the abandonment of the units anchoring structures each time the unit is serviced. Data collection and experiments being conducted at science nodes attached to the anchoring structures would be disrupted by this annual maintenance schedule.

3.3 ALTERNATIVES EVALUATED IN EIR/EIS

Based on the above analyses, alternatives evaluated in the EIR/EIS focus on the location and near shore route of the cable shore landing site, the construction methods required for landing the cable, and the proposed shore facilities location. The Applicant has indicated the proposed cable route is the best route to achieve maximum burial (approximately 76 percent of the route). Alternative landing locations and nearshore routes would not affect the ability of the proposed Project to achieve the desired project objectives. Therefore, these alternatives were considered in context of their ability to reduce the significant environmental impacts of the proposed Project and their technical and regulatory feasibility.

Through the alternatives screening process described in Section 3.1.2, two alternative landing route alignments were chosen for detailed analysis in this EIR/EIS. These alternatives would meet the objectives defined in the Purpose and Need and would place the science node in the area that that provides a deep-water test bed required for testing and development of the NEPTUNE system components and access to areas of scientific interest. The two alternatives would also have the potential to reduce or avoid environmental impacts. The alternatives selected for further analysis include: (1) landing the cable through the existing Duke Energy pipeline at the Jetty at Moss Landing Harbor and pulling the cable through a new conduit placed by directional drilling under the harbor entrance, and (2) landing the cable at the Moss Landing Marine Laboratories (MLML) pier that is scheduled for construction in early 2005. These alternatives are fully described in Section 3.3.1 and 3.3.2. The No Project Alternative is described in Section 3.3.3.

3.3.1 Alternative Landing Area 1: Duke Pipeline to MBARI Property

Description

This Alternative is the same as the proposed Project except that the shore landing would occur through an existing fuel oil pipeline owned by Duke Energy in addition to a HDD-installed conduit which would bring the cable to the landing site in Moss Landing. The pipeline was previously used to unload tankers and extends from shore for approximately 502 feet (153 m) in a west-northwest direction to a water depth of roughly 59 feet (18 m). The pipe is 18-24-inch (46-61-cm) carbon steel and has been well maintained by Duke Energy. The cable would run inside the pipeline from the ocean side entrance to a location on Jetty Road.

At the shore landing, the cable would extend through the existing pipeline to a point where the pipeline becomes exposed on the eastern side of the jetty located on Jetty Road at Moss Landing State Beach (see Figure 3.3-1). An access hatch would be constructed in the pipeline at this location to enable the cable to be pulled ashore from the cable vessel *Ile de Ré*. From this location the cable would extend south under the entry channel to Moss Landing Harbor in a conduit that would be installed by HDD.

As with the proposed Project, all drilling operations, staging and equipment storage would occur on a vacant parcel located on the west side of Sandholdt Road at the road's northern terminus. This site is owned by the Applicant and would be used to land the MARS cable and to install shore facilities at the landing location. The Shore Facility would be the same as the proposed Project and consist of a 20-foot (6-m)-long ISO van placed on a concrete slab located at the north end of Sandholdt Road.

While both Alternative Landing Area 1 and Alternative 4 (Duke Energy Landing, Section 3.2.2) would utilize the Duke Energy oil pipeline to bring the cable to shore, they differ in the locations of the Shore Facility and the locations where the cable would cross Moss Landing Harbor (see Figures 3.2-2 and 3.3-1).

Alternative Landing Area 1 would utilize the same offshore construction techniques identified in the proposed Project including a pre-lay grapnel run to clear any potential obstructions from the cable route, main lay operations to place the cable, and post lay inspection.

The construction schedule for Alternative Landing Area 1 would be similar to the proposed Project. Installation of the cable and node is planned to occur sometime between September 1 and November 15, 2005. The total estimated installation time for cable laying is 10 to 14 days. HDD activities would require about two weeks for completion.

Alternative Landing Area 1 would include the same environmental commitments identified in the proposed Project.

Required Agency Approvals

Implementation of Alternative Landing Area 1 would be subject to the same agency permits and approvals as the proposed Project. Additional information on these requirements is provided in Table 2.7-1 in Section 2.7, Permits, Approvals, and Regulatory Requirements.

3.3.2 Alternative Landing Area 2: Moss Landing Marine Laboratories (MLML) Pier

Description

Alternative Landing Area 2 would consist of the same undersea cable route and science node location as the proposed Project. The only difference in this alternative is that the shore landing would occur at the MLML located approximately 0.6 miles (1 km) south of the entrance to the Moss Landing Harbor. Under Alternative Landing Area 2, the cable would cross the head of the Monterey Canyon near the entrance to the Moss Landing Harbor and extend south to the MLML at a depth of approximately 52.5 feet (16 m) (see Figure 3.3-2). Cable in this portion of the route would be placed in a reticulated metal conduit to provide some protection from seasonal fluctuations in nearshore sediment depths. From a depth of approximately 52.5 feet (16 m) the cable would head inland and be landed at a pier that would be constructed by the MLML. From the pier, the

Placeholder for Figure 3.3-1 Alternative 1: Duke Pipeline to MBARI Property

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Placeholder for Figure 3.3-2 Moss Landing Marine Laboratories

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cable would be placed in a conduit and follow the same path as an existing intake pipe that supplies seawater to the MBARI Building C. The MLML is currently in the process of obtaining the necessary permits to construct the pier and the Applicant has obtained permission to land the cable at this location.

Except for the shore landing at the future MLML pier, Alternative Landing Area 2 would utilize the same installation techniques identified in the proposed Project and Alternative Landing Area 1. HDD would not be used for Alternative Landing Area 2.

Under Alternative Landing Area 2, Building C located at the MBARI would serve as the Shore Facility, and no additional structures would be constructed. Building C would contain the required equipment and power to support the cable and science node operations.

Implementation of Alternative Landing Area 2 would require the cable to be located in an area of geologic instability. Under this alternative, there is serious concern over the survivability of the cable as it crosses the canyon head at the Moss Landing Harbor entrance. In addition, this alternative requires that the MLML complete construction of the planned pier prior to cable-laying operations.

The construction schedule for Alternative Landing Area 2 would be the same to the proposed Project. Construction is planned to occur in September 2005. The shore landing component is expected to require approximately one week for completion.

Required Agency Approvals

Implementation of Alternative Landing Area 2 would be subject to the same agency permits and approvals as the proposed Project. Additional information on these requirements is provided in Table 2.7-1 in Section 2.7, Permits, Approvals, and Regulatory Requirements.

3.3.3 No Project/Action Alternative

The State CEQA and the NEPA Guidelines both require analysis of the No Project/Action Alternative that would include consideration of (a) existing conditions and (b) reasonably foreseeable future conditions that would exist if the proposed Project were not approved (CEQA Guidelines Sec. 15126(d)(4) and NEPA Regulations Sec. 1502.14 (d)). Under the No Project Alternative, it is assumed that the proposed Project would not be built.

Description

Under the No-Project/Action Alternative, the proposed MARS cable would not be installed and the cable would not come ashore at the landing site and connect to the MBARI lab facilities. The Applicant would continue to conduct marine research in the Monterey Bay in accordance with an existing permit issued by the MBNMS. Under the existing permit, undersea cables and cabled observatories or platforms are not authorized. Therefore, deep-sea research would remain limited in scope and duration and would continue to rely on support from existing research vessels and remotely operated vessels (ROVs). In addition, the No Action/Project Alternative would not provide the deep-sea engineering test bed planned for the NEPTUNE project that is proposed for development off of the coast of Washington and Oregon State, which could compromise the implementation of that project and associated research activities.

Under the No Action/Project Alternative, potential impacts from cable laying activities on sensitive marine resources, including hard bottom communities and marine mammals, would not occur and potential disturbance to these resources would remain similar to existing conditions.

Required Agency Approvals

No additional agency approvals would be required for the No Action/Project Alternative.